SRS
savannah river site

Instrument Interfacing Success Stories

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Instrument Interfacing Success Stories

Background

- **Savannah River Site is a Department of Energy Facility**
- **Located in Aiken, SC**
- **Primary work is environmental restoration**
- **Multiple laboratories across the Site**
  - **Ranging from large to small labs doing a variety of work**

Instrument Interfacing Success Stories

Background

- **Most of our instruments are tied into LIMS**
- **Minimal input from users**
- **Faster**
- **Minimize errors**
- **Use Off-the-Shelf software as much as possible**

Instrument Interfacing Success Stories

Background

- **ICP's – Perkin Elmer Optima 3000 XL, Optima 4300 DV**
- **ICP's – Leeman Labs Profile Plus**
- **Gas Flow Proportional Counter – Oxford Tennelec**
- **Alpha Spectrometer – Canberra Alpha Analyst**
- **Liquid Scintillation Counter – Packard Bioscience TriCarb 2500TR**
- **Gamma Spectroscopy - Canberra**

Instrument Interfacing Success Stories

ICP's (EM)

- **Lab has two ICP's – Perkin Elmer Optima 3000 XL, and Optima 4300 DV**
- **Processes 500 analyses per year**

Workflow –

Log samples in LIMS

Run the analysis on the instrument

Copy the data file to predefined directory

A LimsLink method parses the data file

Technician reviews, edits

Technician sends results to LIMS.

Results available in LIMS

Instrument Interfacing Success Stories

ICP's (EM)

- **Automatic <30 seconds per sample**
- **Manual data entry ~3 minutes (and a chance of human error)**

Instrument Design Module - LimsLink v3.1 - [ICP GW (3000 XL):00000455]

System WorkSheet Samples Security Options Window Help

ICP GW (3000XL)		Unit of Analysis	ug/L	Verifier Initial	BLACK	Analysis Method	EPA6010B	Prep Meth:
Dilution Factor	1.00	Archive Label		Analyst Initial	BLACK	ICP batch name	I04I29A	Prep Date_T

	LIMS Sample ID	User Sample ID	Ag 328	Al 308	As 188	B 182	E
1	200018933	LB (ICP)	0.00056835	0.18854925	0.00157223	-0.0081702	0
2	200018934	LCS (ICP)	-0.0001562	0.82759975	0.00296217	-0.0034974	0
3	200018935	LCSD (ICP)	-0.0001898	0.07708753	0.00375258	0.00223696	0
4	200018912	LFW 29/04-827006-00	-0.0001996	0.59594734	0.0026309	-0.0019158	0
5	200018936	LAB DUP (ICP)	0.00036777	0.03344162	0.00349231	-0.0048995	0
6	200018911	LFW 28/04-827004-00	0.00034037	0.06605193	0.00073184	-0.0009111	0
7	200018937	MS (ICP)	0.0000796	0.13819054	0.0009088	-0.0088872	0
8	200018938	MSD (ICP)	-0.0000737	0.01343497	0.00192927	-0.0057578	0
9	200018913	LFW 30/04-827008-00	0.00024955	0.00657782	0.00201766	-0.010848	0
10	200018914	LFW 31/04-827010-00	0.00029458	0.02918803	0.00111581	-0.0082767	0
11	200018915	LFW 32/04-827012-00	0.00025134	0.0318742	0.00059929	-0.0082034	0
12	200018916	LFW 34/04-827016-00	0.00008495	0.00792962	0.00116092	-0.0072098	0
13	200018917	LFW 43B/04-827018-00	-0.000013	0.01684761	0.00217577	-0.0110163	0
14	200018918	LFW 43C/04-827020-00	0.00008997	0.00858009	0.00152926	-0.0084378	0
15	200018919	LFW 43D/04-827022-00	0.00009772	0.02321519	0.00230563	-0.0135581	0
16	200018920	LFW 44D/04-827024-00	-0.0002503	0.07889534	-0.0007511	-0.0126425	0

Instrument Interfacing Success Stories

IDM-3 LIMSLINK

- **Almost all instruments tied in to LIMS via IDM-3 LIMSLink**
- **Commercial product, vendor specific add-ins available**
- **Create “methods” that correspond to instrument data files**
- **Cost $1200 per method per computer**
- **Our Add-ins: $200 / per instrument**
- **Annual cost: $180 / instrument, $450 for add-ins (bulk)**
- **Development time varies, depending on complexity (1 week to months)**

Instrument Interfacing Success Stories

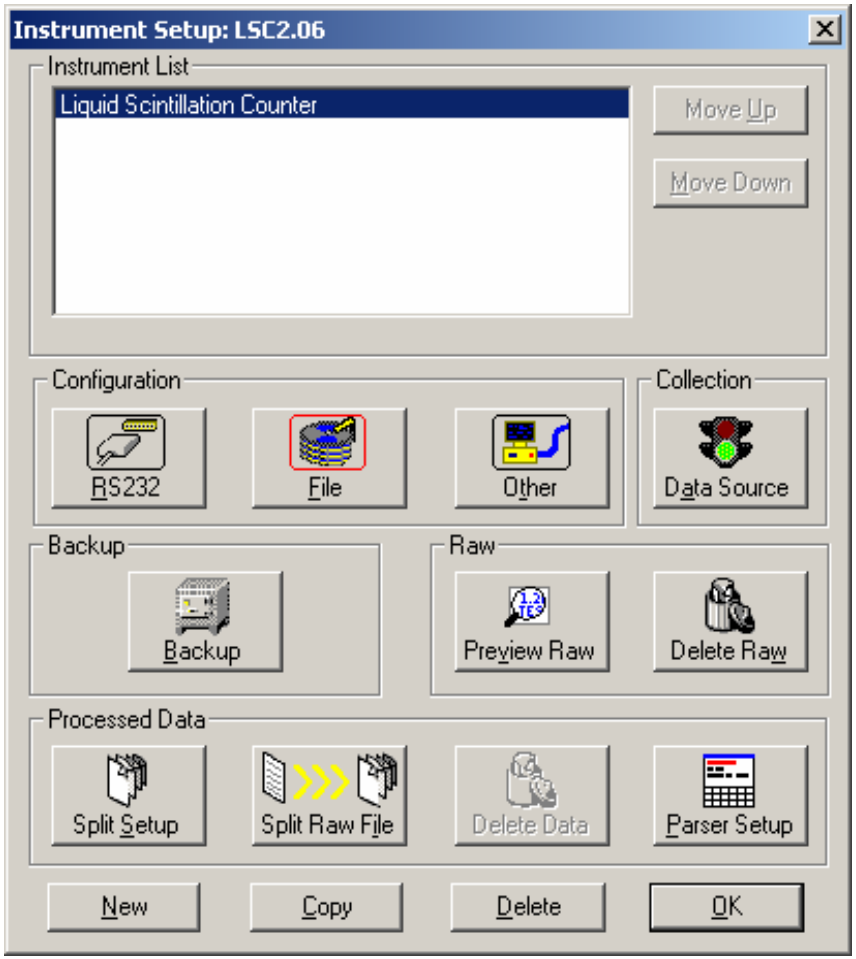
IDM-3 LIMSLINK

- **Instrument setup**

  Serial port

  File

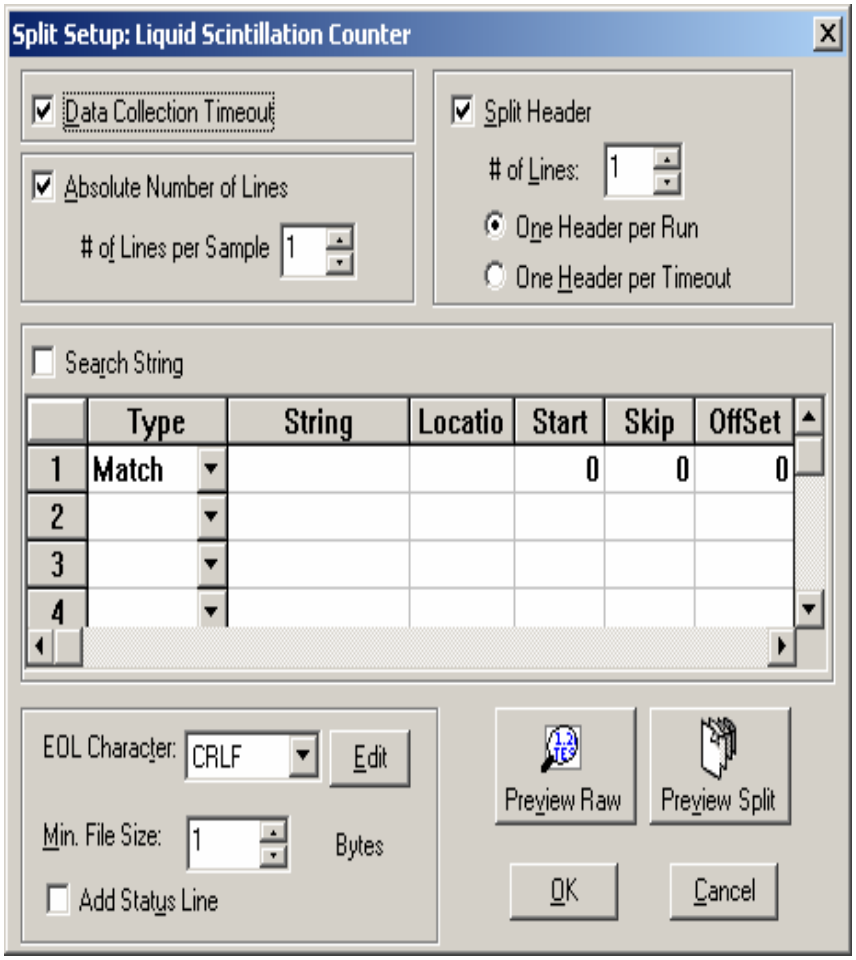
  Other (network)



Instrument Interfacing Success Stories

IDM-3 LIMSLINK

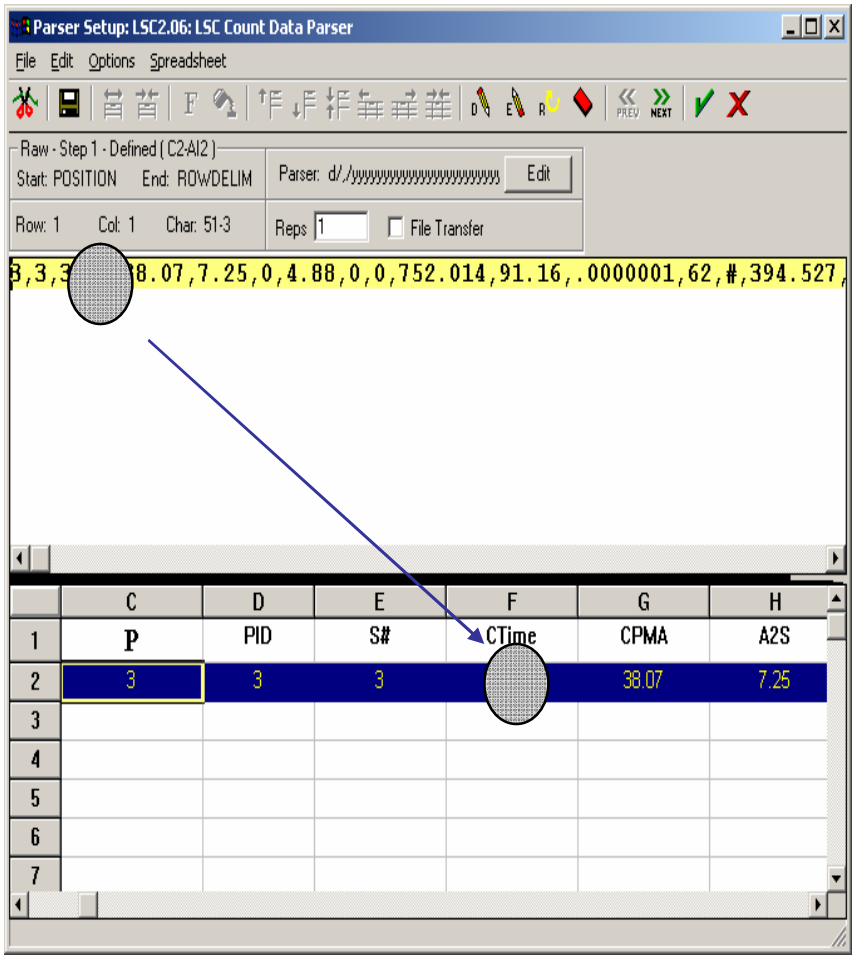
- **Split setup**
- **Define what makes up one sample or run**
- **Can be a single line or multiple lines**



Instrument Interfacing Success Stories

IDM-3 LIMSLINK

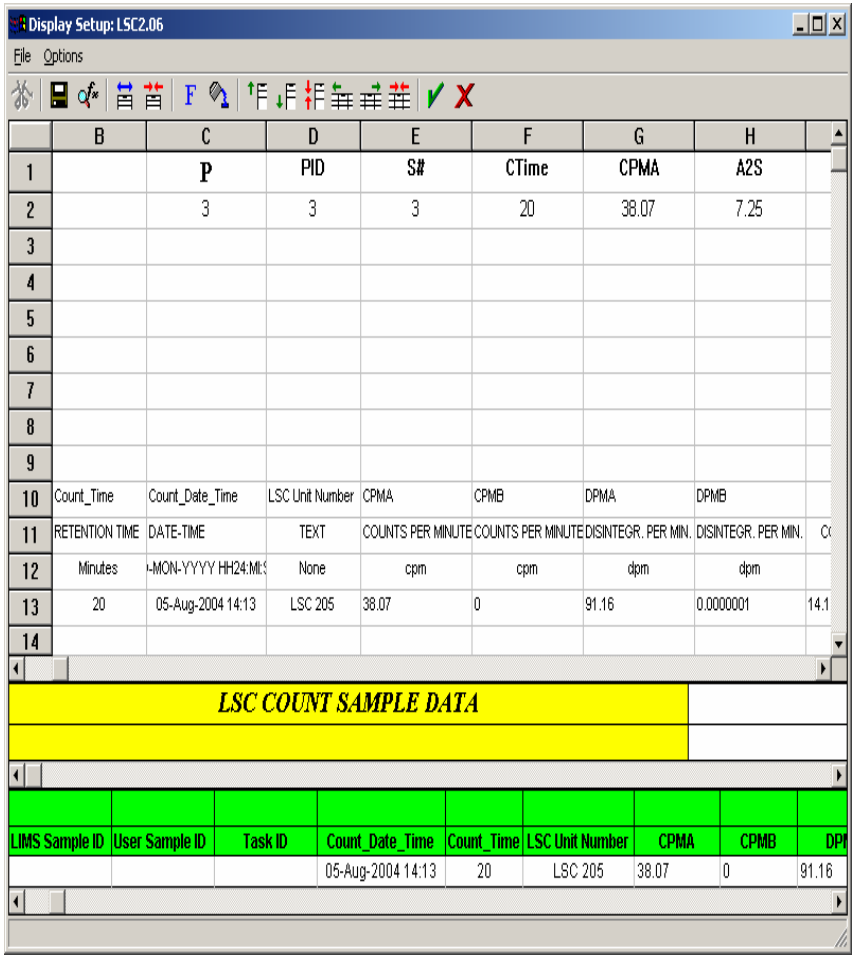
- **Parser setup**
- **Match fields in the line of text with cells**



Instrument Interfacing Success Stories

IDM-3 LIMSLINK

- **Display setup**
- **Similar to MS Excel**
- **Functions, rows, columns**
- **Links from the Single Sample Spreadsheet to the Worksheet**



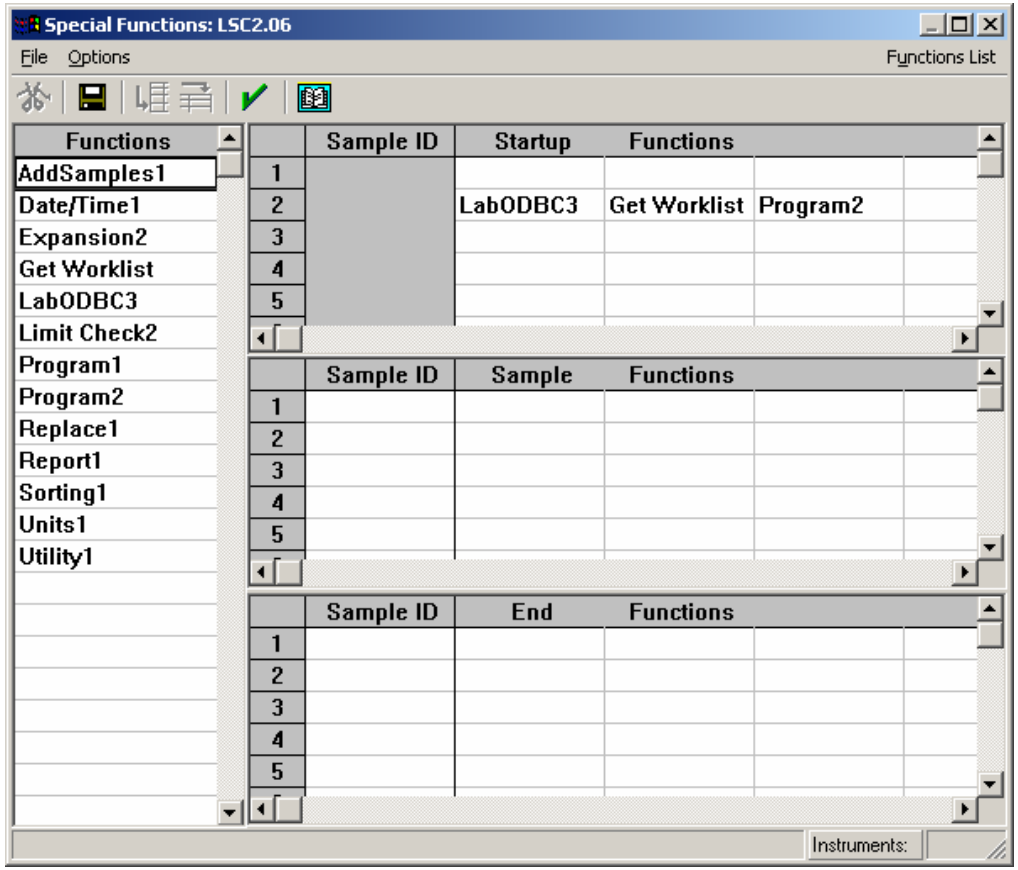
	B	C	D	E	F	G	H
1		P	PID	S#	CTime	CPMA	A2S
2		3	3	3	20	38.07	7.25
10	Count_Time	Count_Date_Time	LSC Unit Number	CPMA	CPMB	DPMA	DPMB
11	RETENTION TIME	DATE-TIME	TEXT	COUNTS PER MINUTE	COUNTS PER MINUTE	DISINTEGR. PER MIN.	DISINTEGR. PER MIN.
12	Minutes	-MON-YYYY HH24:MI:	None	cpm	cpm	dpm	dpm
13	20	05-Aug-2004 14:13	LSC 205	38.07	0	91.16	0.0000001

LIMS Sample ID	User Sample ID	Task ID	Count_Date_Time	Count_Time	LSC Unit Number	CPMA	CPMB	DPI
			05-Aug-2004 14:13	20	LSC 205	38.07	0	91.16

Instrument Interfacing Success Stories

IDM-3 LIMSLINK

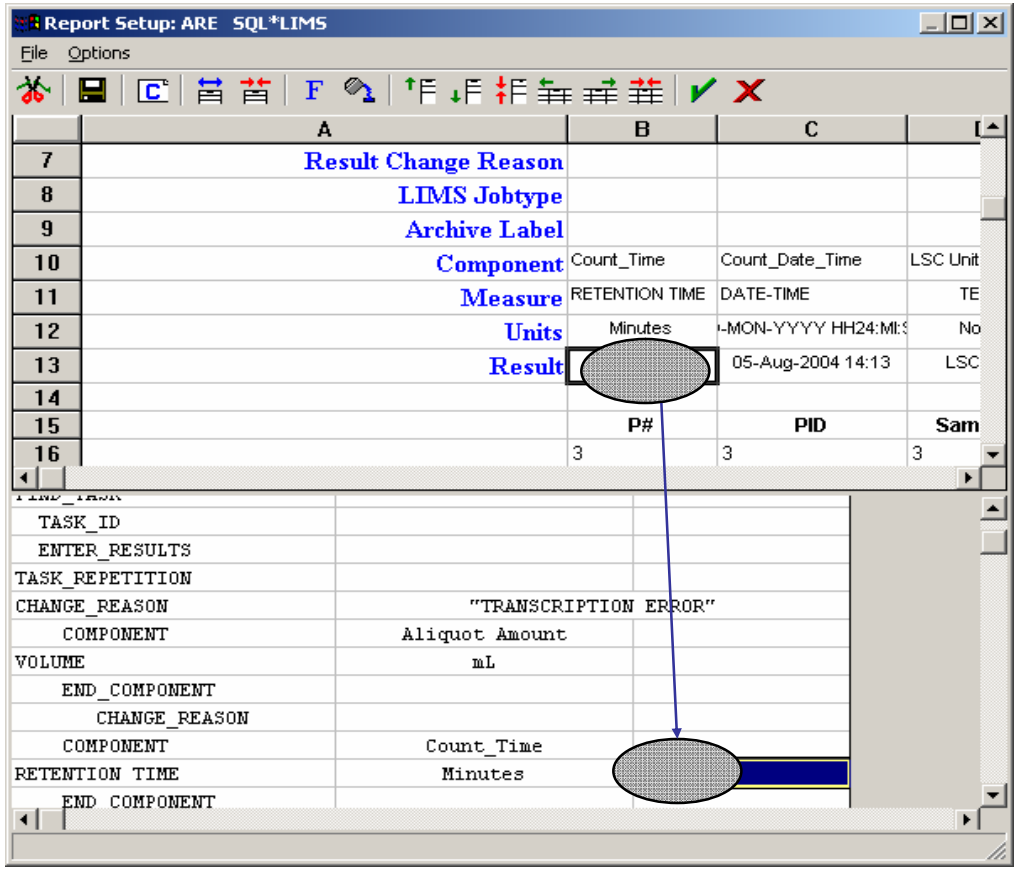
- Special Functions
- Date and time conversion
- Unit conversion
- Sorting
- Get worklist add-in
- LabODBC add-in
- Program 2 add-in



Instrument Interfacing Success Stories

IDM-3 LIMSLINK

- **Report**
- **OK for end user reports**
- **Real use – creating a SQL*LIMS Automatic Results Entry (ARE) file**
- **Automatically sent to LIMS for processing**



Instrument Interfacing Success Stories

Liquid Scintillation Counter

- **Four Counters**
- **High volume – 6000 samples per year**
- **Environmental samples**
- **Average time per sample via automation ~ 20 seconds**
- **Average time per sample by hand estimated at 15 min**

Instrument Interfacing Success Stories

Liquid Scintillation Counter

- **Visual Basic component**
- **Preprocesses data**
- **Combines with batch information**
- **User interface for instrument used, count type**
- **Calculates %Recovery, QC blank check**
- **Starts IDM-3 LIMSLink method**

Instrument Interfacing Success Stories

Liquid Scintillation Counter

- **IDM-3 LIMSLink component**
- **Parses the combined data from the VB component**
- **Gets aliquot size, decay data from database**
- **Calculations and determinations**
- **Sends selected data to the LIMS**

Instrument Interfacing Success Stories

Liquid Scintillation Counter

Workflow –

- **Log samples in LIMS**
- **Run the analysis on the instrument**
- **Copy the data file to predefined directory**
- **Run the VB program from an icon**
- **Enter additional data**
- **In IDM-3 LIMSLink, run get worklist function, LabODBC function, NAD Calculation function**
- **Technician reviews, edits**
- **Technician sends results to LIMS.**
- **Results available in LIMS**

Instrument Interfacing Success Stories

ICP's (DWPF)

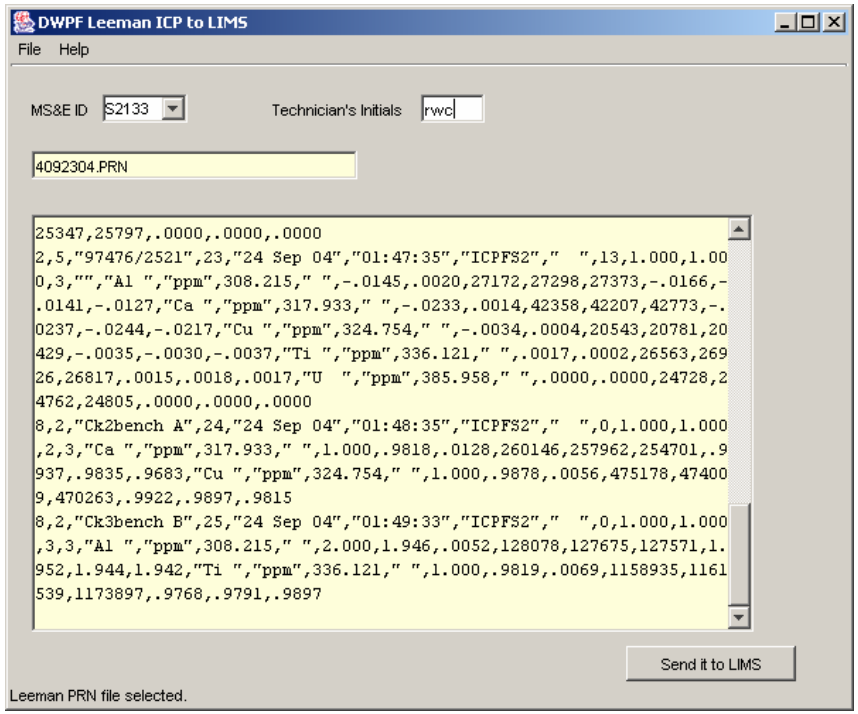
- **Lab has two ICP's – both Leeman Labs Profile Plus**
- **Process 1640 runs per year (86,500 results)**
- **Saves 1-1/2 hour per run, plus verification time**
- **Interface to a custom LIMS (i.e. - no add-ins available)**
- **Written entirely in Java**
- **Cleanest interface, but required custom programming**
- **Four weeks to write, test, deploy**

Instrument Interfacing Success Stories

ICP's (DWPF)

Workflow –

- **Log samples in LIMS**
- **Run the analysis on the instrument**
- **Copy the data file to predefined directory**
- **Technician opens file, add MS&E ID**
- **The interface application parses the data file**
- **Technician sends results to LIMS.**
- **Results available in LIMS**



Instrument Interfacing Success Stories

Conclusion

- **Wide variety of instruments interfaced**
- **Common thread – machine readable report from instrument**
- **Varying degrees of work required to interface**
- **All save data entry time and errors**